PROC. ENTOMOL. SOC. WASH.
94(2), 1992, pp. 276–281

A NEW GENUS OF CERATOPOGONINI (DIPTERA: CERATOPOGONIDAE) FROM BRAZIL

Willis W. Wirth

Cooperating Scientist, Systematic Entomology Laboratory, USDA, and Research Associate, Florida State Collection of Arthropods, 1304 NW 94th St., Gainesville, Florida 32606.

Abstract.—**Bahiahelea**, new genus is described from Bahia, Brazil, with type-species **Bahiahelea brasiliensis**, new species. The species is illustrated and characters are given to distinguish the genus from other predaceous midges of the tribe Ceratopogonini.

Key Words: Diptera, Ceratopogonidae, Ceratopogonini, predaceous midges, Brazil

Recent collections from emergence traps in a cacao plantation in Bahia, Brazil, yielded midges apparently representing a new genus of the predaceous midge tribe Ceratopogonini. The midges resemble species of *Neurohelea* Kieffer and *Neurobezzia* Wirth and Ratanaworabhan in the tribe Heteromyiini, but a close examination of structural details, especially of the male and female genitalia, indicates that they are members of the tribe Ceratopogonini.

For an explanation of ceratopogonid terminology see the publications by Wirth et al. (1977) and Downes and Wirth (1981). The holotype and allotype are deposited in the Museu de Zoologia, Universidade de Sao Paulo, Sao Paulo, Brazil. Paratypes will be deposited in the National Museum of Natural History, Smithsonian Institution, Washington, D.C.; British Museum (Natural History), London; Museum National d'Histoire Naturelle, Paris; Canadian National Collection, Agriculture Canada, Ottawa; Instituto Oswaldo Cruz, Rio de Janeiro, Brazil; and Museo de La Plata, La Plata, Argentina.

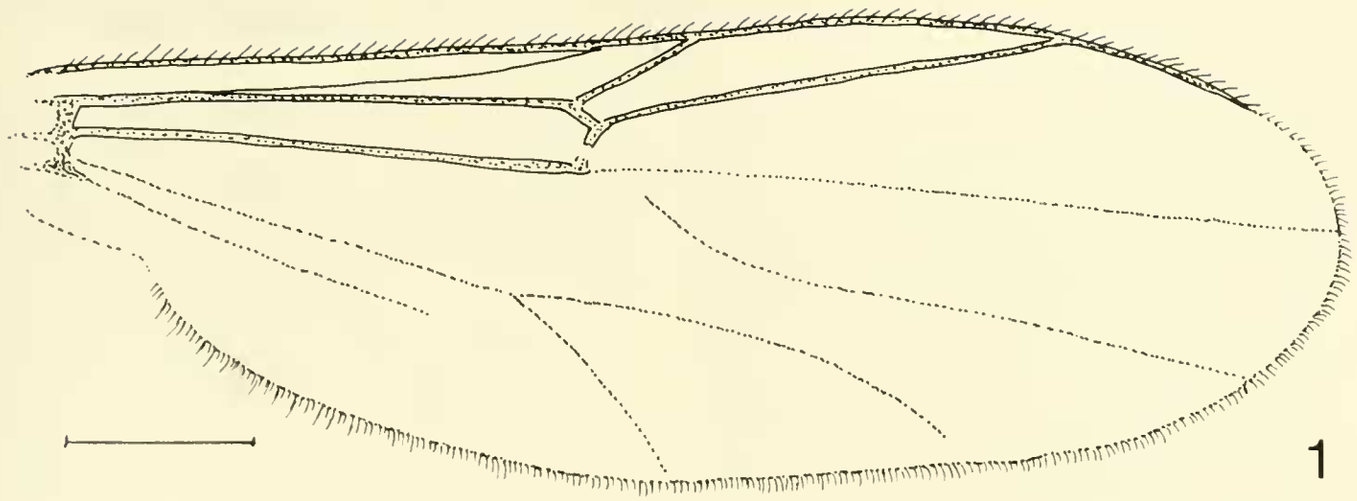
Bahiahelea Wirth, New Genus

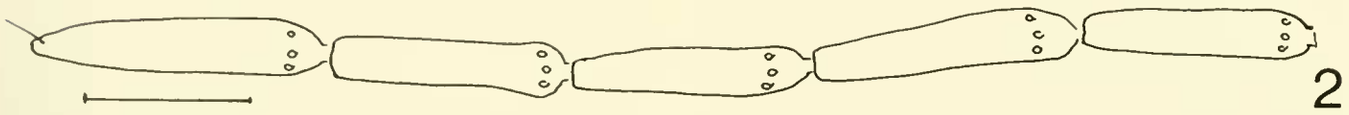
Type-species, *Bahiahelea brasiliensis,* New Species, by present designation.

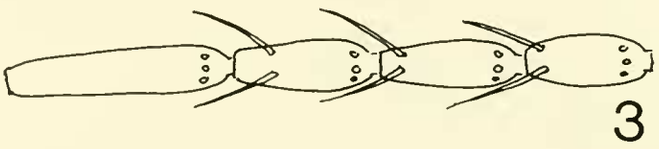
Diagnosis.—Small blackish midges with unmarked wings and unarmed legs; wing length 1.1–1.4 mm.

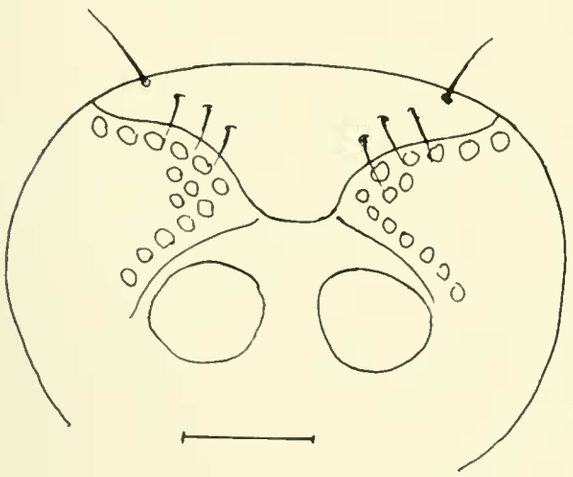
Head: Eyes (Fig. 4) broadly separated, bare. Antenna (Figs. 2, 3) moderately long, distal five segments slightly elongated in female, distal four elongated in male; male antenna with well-developed plume. Palpus (Fig. 5) 5-segmented, elongate, third segment slightly swollen, without pit but a few sensilla borne on ventromesal surface. Female mandible with seven well developed teeth.

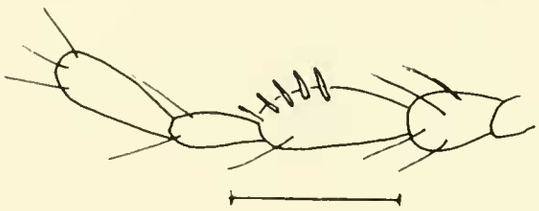
Thorax: Robust, without strong bristles or anterior spine or tubercle (Fig. 9). Legs moderately slender, femora unarmed; tarsi with strong ventral spines only at apices of tarsomeres 1–3 of mid leg; ventral palisade setae (bulbous hairs) only on hind basitarsus; tarsomere 4 short and more or less cordiform (Figs. 6–8); tarsomere 5 slender and elongate, unarmed ventrally, not inflated on fore leg. Female claws (Figs. 6–8) long and slender, gently curved, subequal, each with slender basal inner tooth. Wing (Fig. 1) of both sexes with costa produced beyond tip of R4 + 5 to 0.9 of wing length; one radial cell, extending to 0.8 of wing length in female, radial cell broad, especially at base; media forking slightly past r-m crossvein,

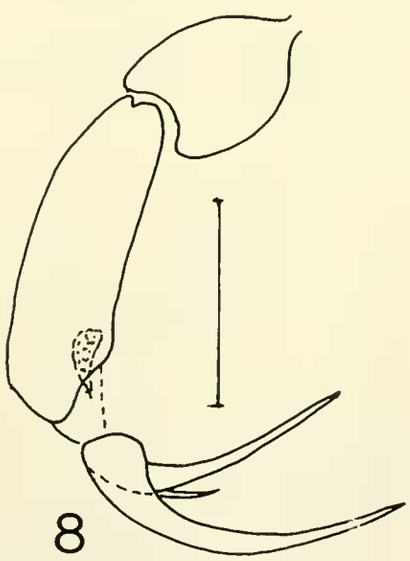












Figs. 1–8. *Bahiahelea brasiliensis*, female: 1, wing. 2, antennal segments 11–15. 3, antennal segments 8–11. 4, eye separation. 5, palpus. 6, fourth and fifth tarsomeres and claws of fore leg. 7, same, mid leg. 8, same, hind leg. Scale bar = 200 microns, Fig. 1; 50 microns, Figs. 2–8.

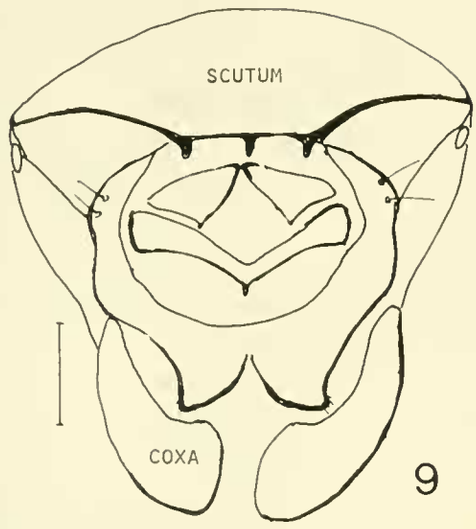
fork thus with short petiole, vein M2 narrowly interrupted at base.

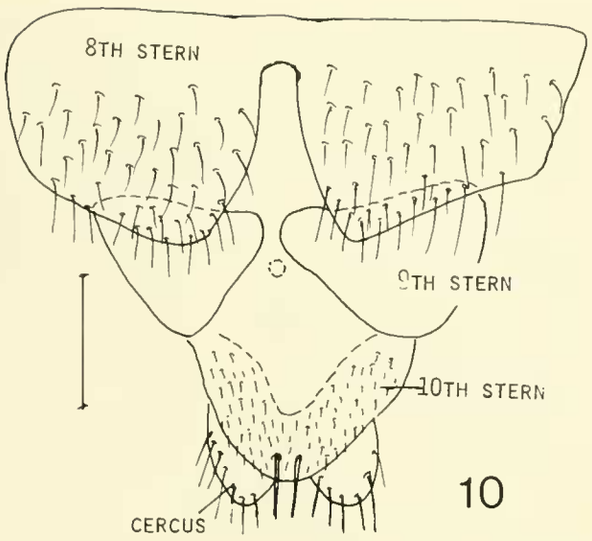
Abdomen: Female abdomen moderately stout, eighth sternum (Fig. 10) cleft mesally nearly to anterior margin, the lobes setose; lobes of ninth sternum strongly sclerotized near gonopore. Two subspherical to short-oval spermathecae (Fig. 12), each with slender neck. Male genitalia (Fig. 14) large and strongly sclerotized; ninth segment forming a cylindrical structure slightly longer than broad; tergite 9 tapering caudally to blunt apex; sternite 9 (Fig. 15) with deep caudomedian concavity, the bluntly angular sublateral lobes articulating distally with mesal angulation of basistyles and lateral arms of aedeagus. Basistyle (Fig. 14) stout, swollen at base, with distinct mesal protuberance at basal third; dististyle long and slender, hooklike. Aedeagus (Fig. 15) strongly sclerotized, basal arms directed laterad, basal arch absent; distal process in ventral view (Fig. 15) broad with rounded tip, in lateral view (Fig. 11) bilobate and directed posteroventrad. Parameres (Fig. 14) small and displaced caudad by a large, globular, sclerotized anterior vesicle (Fig. 11) that fills the space between bases of basistyles and distal portion of ninth sternite; parameres themselves with boomerang-shaped basal arms articulating with mesal protuberance of basistyle; fused on distal halves, the distal portion caplike with sharp lateral subapical points directed dorsad; cerci located at apex of tergite 9.

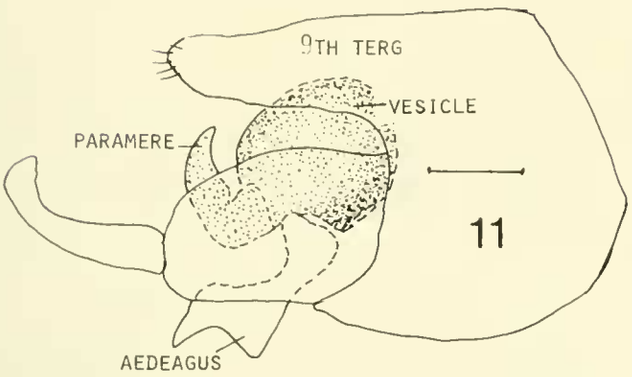
Discussion.—The bare wing with the media forking distad of the r–m crossvein, vestigial empodium, elongate female claws, and presence of palisade setae on the hind basitarsus will place *Bahiahelea* in the tribe Ceratopogonini of the subfamily Ceratopogoninae. *Bahiahelea* will key out in Wirth and Grogan's (1988) revision of the tribe Ceratopogonini to couplet 19 with *Brachypogon (Brachypogon)* Kieffer (1899) and *Afrohelea* Wirth (1965), but due to the artificial nature of the key it is not closely related to them. *Bahiahelea* lacks sensilla coeloconica on antennal segments 3 (a valuable character for determining relationships in this tribe) thus differing from *Brachypogon,* and the male antenna is plumose (as usual), thus differing from *Afrohelea.*

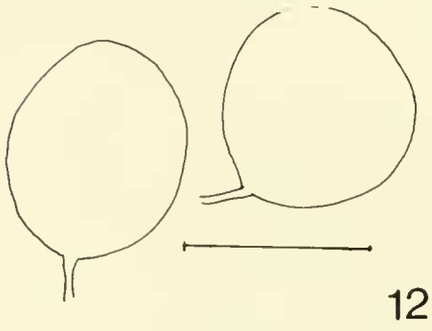
Bahiahelea appears to be most closely related to a group of genera in the Ceratopogonini in which, at least in the female, the (second) radial cell is elongate, extending to at least 0.80 of the wing length, and the costa continues past its apex nearly to the wing tip. Wirth and Grogan (1988: 49) presented a table of characters comparing these genera. *Parabezzia* Malloch (1915) differs in its 4-segmented palpus, female tarsal claws usually unequal, the male fore coxae with dense long spinelike bristles, and male genitalia of typical ceratopogonine structure but with poorly developed parameres. *Diaphanobezzia* Ingram and Macfie (1931) resembles *Parabezzia* in differing from *Bahiahelea,* but has only sparse spinelike setae on the male fore coxae, straplike halteres, and equal female tarsal claws. *Fittkauhelea* Wirth and Blanton (1970) has pubescent eyes, 4-segmented palpus, female tarsal claws subequal to slightly unequal, female spermathecae without necks, and male parameres absent. *Heteroceratopogon* Wirth and Grogan (1988) differs in having two well-developed radial cells on the wing, fore femur greatly swollen with numerous stout ventral spines, female tarsal claws subequal to slightly unequal, and male parameres absent. The male genitalia of *Bahiahelea* somewhat resemble those of several genera of Ceratopogonini, but are so highly modified in the shape and arrangement of the ninth sternite, aedeagus, and parameres, and especially the strange internal vesicle, that they cannot be closely compared with any other known genus of Ceratopogonidae.

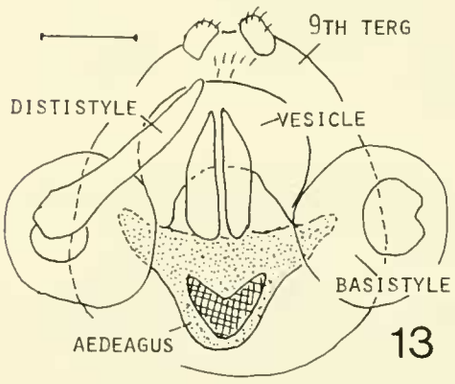
Bahiahelea bears a close superficial resemblance to the genera *Neurohelea* Kieffer (1925) and *Neurobezzia* Wirth and Ratanaworabhan (1972) in the tribe Heteromyiini,

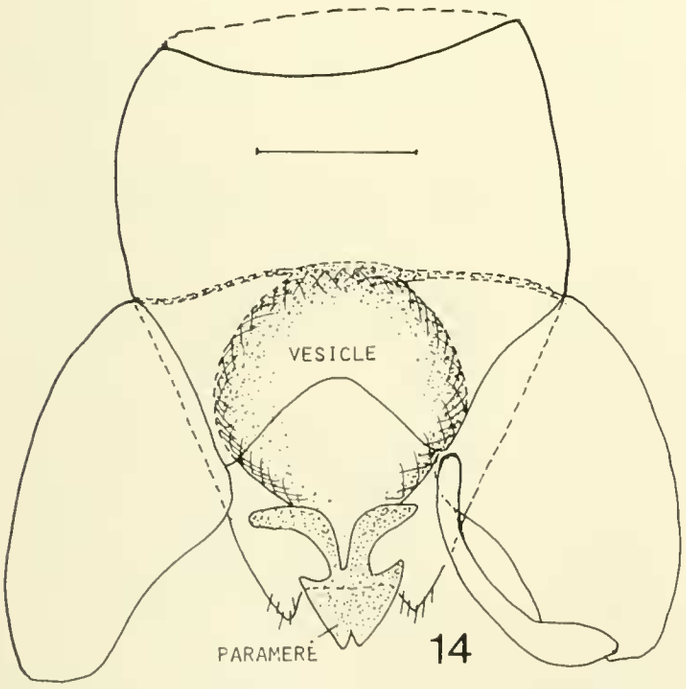


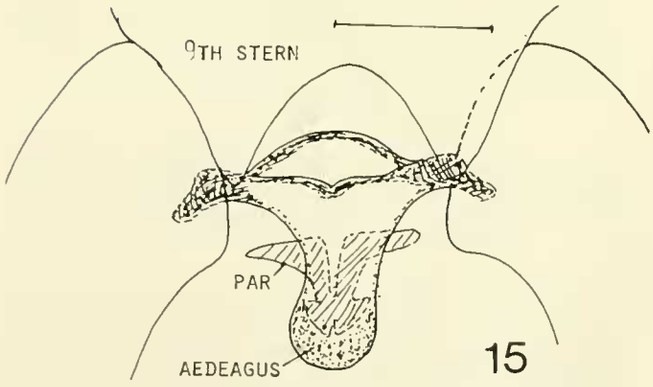












Figs. 9–15. *Bahiahelea brasiliensis*, 9–10, 12, female; 11–15, male: 9, anterior view of thorax, diagrammatic. 10, eighth, ninth, and tenth sternites and cerci, ventral view. 11, genitalia, lateral view. 12, spermathecae. 13, posterior view of genitalia, diagrammatic. 14, genitalia, ventral view. 15, detail of aedeagus, ventral view, with portions of ninth sternite and basistyles, and parameres (cross-hatched). Scale bar = 100 microns, Fig. 9; 50 microns, Figs. 10–15.

in body size and habitus; wing with elongate radial cell and costal extension; equal, elongate tarsal claws with well-developed inner basal teeth; slender, unmodified femora; and cordiform fourth tarsomeres. The male genitalia of *Neurohelea,* however, are typically Heteromyiine, resembling those of the genus *Pellucidomyia* Macfie (1939). I have the undescribed pupa of *Neurohelea nigra* Wirth (1952), which resembles that of *Parabezzia,* differing from the pupa of *Clinohelea* Kieffer (1917) in the Heteromyiini, and indicating that *Neurohelea* (and possibly *Neurobezzia,* whose male and pupa are undescribed) may belong in the Ceratopogonini near *Bahiahelea.* Grogan and Wirth (1979) discussed generic relationships in the tribe Heteromyiini and gave a key to the genera. Clastrier (1983) described a second species of the genus *Neurobezzia.* The male of *Neurobezzia* remains undescribed, as the male described by Grogan and Wirth (1978) and attributed to *N. granulosa* (Wirth) (1952) is a species of *Palpomyia* Meigen (1818).

Bahiahelea brasiliensis **Wirth,** NEW SPECIES (Figs. 1–15)

Female holotype.—Wing length 1.36 mm; breadth 0.50 mm.

Head: Dark brown including antennae and palpi. Antenna with lengths of flagellar segments in microns: 61-43-43-43-43-43-47-47-79-82-86-90-87; antennal ratio (11-15/3-10) 1.07. Palpus with lengths of segments in microns: 14-36-47-32-47. Mandible with seven strong teeth distally and 4–5 barely perceptible proximal ones.

Thorax: Dark brown; mesonotum with sparse, fine, hairlike, brownish setae, stronger above wing bases; scutellum with 18 fine setae. Legs dark brown on femora and tibiae, tarsomeres 1–2 whitish, 3–5 brownish; femora and tibiae moderately stout, tibiae without strong extensor setae; hind tibial comb with eight slender spines, the spur short and inconspicuous. Hind leg with lengths from femur to tarsomere 5 in microns: 690-620-288-100-72-43-85. Mid tarsus with one strong spine at base of tarsomere 1, two apical spines on tarsomeres 1–3; hind basitarsus with abrupt bend at base. Claws (Figs. 6–8) long, slender and equal on all legs, each with short, slender, basal inner tooth; lengths: 86 microns on fore leg, 72 on mid leg, and 79 on hind leg. Wing (Fig. 1) slightly infuscated due to coarse microtrichia, veins brownish; one radial cell extending to 0.81 of wing length; costa produced further to 0.90 of wing length, less conspicuous distally; media with short petiole, vein M2 narrowly interrupted at base. Halter pale.

Abdomen: Pale brown, with sparse short brownish setae arising from pigmented sockets; segments 8 and 9 more strongly pigmented; sternum 8 setose, divided on midline; lobes of sternum 9 blunt, deeply pigmented (Fig. 10). Spermathecae (Fig. 12) two, slightly unequal, short oval to subspherical, with slender necks; measuring 61 by 59 microns and 58 by 50 microns, necks 11 to 17 microns long.

Male allotype.—Wing length 1.11 mm; breadth 0.39 mm.

Similar to the female with the usual sexual differences. Antenna with dense brown plume arising from segments 3–12; lengths of flagellar segments in microns: 83-50-47-47-47-43-43-43-54-72-86-86-90; antennal ratio (12-15/3-11) 0.73. Palpus with lengths of segments in microns: 17-28-43-32-43. Hind leg with lengths from femur to tarsomere 5 in microns: 516-454-220-94-65-36-79. Claws equal on all legs, stout and curved to sharp points, length 29 microns. Wing as in female but costa shorter, costal ratio 0.84.

Genitalia (Figs. 11, 13–15): As in generic diagnosis, large and strongly sclerotized. Ninth segment as in Fig. 14. Basistyle (Fig. 14) stout, swollen at base, tapering and mesally somewhat concave distally; dististyle (Fig. 14) long and slender, somewhat curved hooklike. Aedeagus (Figs. 11, 15) with

strongly sclerotized basal arms directed laterad at level to tips of lobes on ninth sternum, without basal arch but with low basal convexity; distal process broad with rounded tip. Parameres as in Figs. 11, 13–14.

Distribution.—Brazil.

Types.—Holotype female, Brazil, Bahia, Itajuipe, Fazenda Almirante, 9.xii.1988, J. A. Winder, in emergence trap. Allotype male, same data but date 21.x.1988. (Holotype and allotype deposited in the Museu Zoologia, Universidade de Sao Paulo, Sao Paulo, Brazil). Paratypes, 7 males, 9 females, same data but dates 21.x.1988, 18.xi.1988, 9,15,23.xii.1988, 19.iv.1989, 3.vii.1989, 6,8,13.xii.1989, 17.22.x.1990, 2.xi.1990.

Discussion.—Since *Bahiahelea brasiliensis* is the only known species of the genus, refer to the discussion under the generic diagnosis.

Acknowledgments

I am greatly indebted to Art Borkent, Salmon Arm, British Columbia, for critical examination of my type material and for preliminary sketches of the thorax and male genitalia, as well as for helpful advice on the taxonomic position of *Bahiahelea*. I also thank J. A. Downes, Canadian Museum of Nature, Ottawa, and William L. Grogan, Jr., Salisbury State University, Salisbury, Maryland, for review of an early draft of the manuscript and for helpful taxonomic discussions.

Literature Cited

Clastrier, J. 1983. Ceratopogonidae des Iles Seychelles (Diptera, Nematocera). Mémoires du Museum National d'Histoire Naturelle. Nouvelle Série. Série A, Zoologie 126: 1–83.

Downes, J. A. and W. W. Wirth. 1981. Ceratopogonidae, pp. 393–421. *In* McAlpine, J. F., et al., eds., Manual of Nearctic Diptera. Vol. 1. Agriculture Canada Monograph No. 27, 11: 1–674.

Grogan, W. L., Jr. and W. W. Wirth. 1978. Description of the male of *Neurobezzia granulosa* (Wirth) (Diptera: Ceratopogonidae). Proceedings of the Entomological Society of Washington 80: 548–552.

———. 1979. A new Neotropical genus of predaceous midges, with a key to the genera of Heteromyiini (Diptera: Ceratopogonidae). Proceedings of the Entomological Society of Washington 81: 51–59.

Ingram, A. and J. W. S. Macfie. 1931. Ceratopogonidae. Diptera of Patagonia and South Chile, Part II, Fascicle 4, pp. 155–232.

Kieffer, J. J. 1899. Description d'un nouveau genre et tableau des genres européens de la famille des Chironomides. Bulletin de la Société Entomologique de France 1899: 66–70.

———. 1917. Chironomides d'Amérique conservés au Musée National Hongrois de Budapest. Annales Musei Nationalis Hungarici 15: 292–361.

———. 1925. Diptères (nematoceres piqueurs): Chironomidae Ceratopogoninae. Faune de France 11. 138 pp.

Macfie, J. W. S. 1939. Ceratopogonidae. Ruwenzori Expedition 1934–5. 1: 81–107.

Malloch, J. R. 1915. The Chironomidae or midges of Illinois. Bulletin of the Illinois State Laboratory of Natural History. 10: 213–243, 23 plates.

Meigen, J. W. 1818. Systematische Beschreibung der bekannten europäischen zweiflügeligen Insekten. 1: 1–416 Hamm.

Wirth, W. W. 1952. The Heleidae of California. University of California Publications in Entomology 9: 95–266.

———. 1965. A revision of the genus *Parabezzia* Malloch (Diptera, Ceratopogonidae). Proceedings of the Entomological Society of Washington 67: 215–230.

Wirth, W. W. and F. S. Blanton. 1970. New genera of Neotropical Ceratopogonidae (Diptera). Florida Entomologist 53: 7–14.

Wirth, W. W. and W. L. Grogan, Jr. 1988. The predaceous midges of the world (Diptera: Ceratopogonidae; Tribe Ceratopogonini). Flora & Fauna Handbook No. 4, i–xvi + 160 pp.

Wirth, W. W. and N. C. Ratanaworabhan. 1972. A new genus of biting midge from California related to *Neurohelea* Kieffer (Diptera, Ceratopogonidae). Pan-Pacific Entomologist 48: 244–245.

Wirth, W. W., N. C. Ratanaworabhan, and D. H. Messersmith. 1977. Natural History of Plummers Island, Maryland. XXII. Biting midges (Diptera: Ceratopogonidae). I. Introduction and key to genera. Proceedings of the Biological Society of Washington 90: 615–647.